

RESEARCH SUPPORTING SOUND DECISIONS

**Joint
Fire Science
Program**



**2008
2009**

**PROGRESS
REPORT**

CELEBRATING 10 YEARS OF DISCOVERIES

Celebrating 10 years of Discoveries

We have learned much.

The interagency Joint Fire Science Program (JFSP) is celebrating ten years of science discoveries focused on helping fire and resource managers understand the complexities of wildland fire and fuels management. Our first responsibility is to provide credible peer-reviewed science tailored to the needs of fire and fuel managers. But we also focus on science delivery with a suite of communication tools such as our Fire Science Digest and Fire Science Brief publications that reach over 10,000 managers.

The Program looks forward to the 4th International Congress on Fire Ecology and Management sponsored by the Association for Fire Ecology. This international conference will feature a look back at what the Program has achieved in the past 10 years and invite participants to help look into the future to describe fire science priorities. The Program is inviting the preeminent scientists and managers to make state-of-the-science presentations and to publish synthesis papers about the issues discussed. Save the dates of November 30-December 4, 2009. We hope to see you in Savannah, Georgia.

An interagency, international team of scientists and managers reviewed the Program assessing the status, effectiveness, relevance, and future direction of the program, as well as reviewing progress made following the previous assessment conducted in 2003. We will share preliminary results later in this document.

We are very excited about a new endeavor we call the JFSP Findings Database where managers can learn “at-a-glance” the specific information they need to incorporate into planning and decisions from every JFSP project. Whether you are in Alaska or Florida, the JFSP Findings Database will get you answers fast.

As you read further, we invite you to discover our new series of synthesis publications and learn about Roadshows where we bring scientists and managers together in the outdoors to demonstrate research findings.

You will see the Program is moving ahead with opportunities to integrate our discoveries and build applications designed to serve not only the needs of managers, but display the opportunities and consequences of management plans to stakeholders through our Interagency Fuels Treatment Decision Support System currently being developed.

Much has been discovered, but there is much more work ahead...



Chainsaws or Driptorches: How Should Fire Risk Be Reduced?

Summary

Forest managers have a standard set of tools they use to reduce fire hazard: mechanical thinning, brush clearing, mechanical treatment of slash (small woody debris), prescribed fire, and various combinations and timings of the use of these tools. Although these tools are widely used, the science is sketchy on the benefits and costs of the different treatments. In response, the National Fire and Fire Surrogate Study (NFSS) set up a national network of research sites to study the effects of the “burnings,” such as mechanical thinning, mechanical slash treatments, and prescribed fire on forests.

Early findings for the Sierra Nevada NFSS site are reported here. The study used four treatments: prescribed fire only, mechanical only, mechanical plus fire, and no-treatment controls. All three active fuel treatments significantly reduced fire risk, but the two treatments that used prescribed fire to reduce surface fuels achieved the greatest reductions in potential fire behavior. The mechanical-only treatment (mechanical thinning followed by mechanical slash treatment) reduced crown bulk density and ladder fuels but increased surface fuels, and it was less effective in reducing fire risk. The active treatments also had noticeably different consequences on forest structure and predicted fire mortality. A pre-treatment assessment can determine the level of fire hazard from the surface, ladder, and crown fuels, and a prescription can be designed to limit the fuel layers creating the risk.

Fire Science Brief Volume 8 March 2008 Page 1 www.fire-science.gov



Big Changes in the Great Basin

JFSP-funded researchers are exploring the ecological functioning of sagebrush-steppe communities in the Great Basin and other places in the dry Intermountain West.

Their work is helping managers effectively use tools such as tree mastication and prescribed fire to help these communities become more resilient in the face of invasive weeds.

Other research is finding ways to reestablish native vegetation on sites where woody invaders have pushed the community past the point where it can recover on its own.



Towards Integrated Solutions

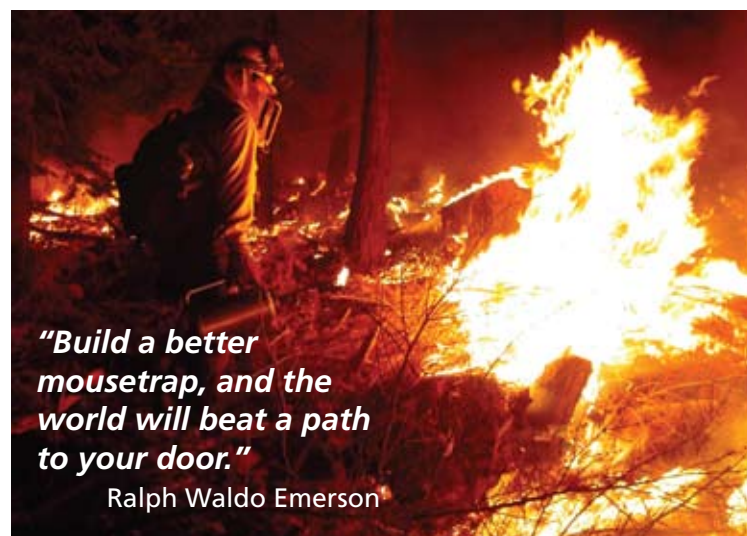
Over the last several years, the Joint Fire Science Program (JFSP) has listened closely to fire managers across the country to determine investment priorities for new research and development. Guiding the JFSP Governing Board is an awareness that, “It is not good enough to simply identify and interact with our customer base. To succeed, we must provide information that will help solve our customers’ problems. For major projects or new lines-of-work that lead to a variety of related products, we will institute a problem framing process that gives customers a central role in defining what information or tools are needed, when they are needed, and how they will function and be delivered.”

We will transition from a system where Announcements for Proposals (AFPs) are used to attract high quality, but unrelated research studies, to one where combinations of AFPs and targeted solicitations are used to craft programs of work that will increase the focus and productivity of the JFSP” (excerpted from the JFSP Science Delivery Strategy).

What are Lines of Work?

Lines-of-work focus JFSP investments on selected topics developed in consultation with managers. Most of the problems faced by JFSP customers are complex and require a number of studies in a coordinated, multi-year approach. The outcome of the research will lead to new innovations – integrated tools and technology- that can be implemented on the ground. The JFSP Governing Board is investing in the following three lines-of-work over the next 5 years:

- ❖ Software systems integration – The Interagency Fuels Treatment Decision Support System
- ❖ Fuel treatment
- ❖ Smoke management



“Build a better mousetrap, and the world will beat a path to your door.”

Ralph Waldo Emerson

System Integration

An Interagency Fuels Treatment Decision Support System

The JFSP, through interactions with its partners and clients, became convinced that a significant problem facing fire and fuels managers is the confusion and inefficiency associated with the many existing software systems intended to help fire and fuels managers. These systems have proliferated in the last decade in response to various funding initiatives, including JFSP, without any central control or vision. Managers are left with an assortment of unconnected systems in various stages of development with little guidance concerning the strengths and weaknesses of the various systems, and no framework for integration and fusion of data and outputs from these systems.

One of the principal voices articulating this problem has been the National Interagency Fuels Coordination Group (NIFCG). Acting in concert with the NIFCG, the JFSP initiated the Software Tools and Systems Study in 2007. The JFSP funded Carnegie Mellon University Software Engineering Institute (SEI) to perform a strategic analysis of this problem. This analysis was completed in March 2008. One of the key findings of the SEI study was that “the wildland fire and fuels management community needs a platform and approach that supports distributed collaboration.”

The JFSP came to understand through its interactions with SEI that a platform that supports distributed collaboration includes certain key components:

- ❖ A software framework architecture that facilitates use and integration of data and scientific models, including a common user interface and shared data structures
- ❖ The flexibility for users to select and compose their own data and chain of models to help solve their own specific problems
- ❖ A clearly articulated set of standards so that software developers can develop models and modules that will function within the software framework architecture
- ❖ A lifecycle management system with processes to set priorities for software system development, training, and retirement



Phase Two

Interagency Fuels Treatment Decision Support System

The JFSP and NIFCG have now completed a second phase that further investigated the feasibility of developing a web-based, service-oriented framework architecture to support distributed collaboration to solve fuels management planning and analysis problems. The system will be designed to help Fuels Planners on a typical Interdisciplinary (ID) Planning Team develop explainable and supportable project planning alternatives for the treatment of fuels from the perspective of fire risk and fire effects. The Fuels Planner, working in close cooperation with other specialists on the ID Team, is expected to use the information to make recommendations for the decision process and to assist with National Environmental Policy Act (NEPA) analysis for the project area, if one is required.

The SEI study identified the Bluesky framework architecture as a leading example of how scientific models can be modularized and connected to create a web-based collaborative architecture system. The Bluesky framework was developed through the leadership of the US Forest Service, Pacific Northwest Research Station, AirFire research team for the smoke management community. It is unique in that it offers operational customization to allow smoke managers to select and execute commonly used tools and modeling systems to fit scenarios defined by the user.

Phase Two work included the following activities:

- ◆ Further investment in BlueSky to develop its potential as a web-based, user-friendly framework architecture
- ◆ Evaluation of Bluesky, the Wildland Fire Decision Support System (WFDSS), continued examination of other software integration systems for potential use as a framework architecture for the fuels analysis and planning domain
- ◆ Development of a conceptual design and technical architecture specification for a software framework architecture for the fuels analysis and planning domain
- ◆ Evaluation and categorization of existing software systems used for the fuels analysis and planning domain for potential inclusion in a framework architecture
- ◆ Testing the new Wildland Fire Information Technology Investment process as a software lifecycle management process
- ◆ The program is now beginning a new phase to develop a prototype fuels treatment decision support system

Simulate Vegetation Dynamics

Design Treatment Strategies

Analyze Fire Behavior/Effects and Risk

Simulate Fire Behavior

Display and Modify Data

Define Landscape and Space

The Interagency Fuel Treatment Decision Support System will offer a framework to gather data, analyze fire behavior, fire effects, and values at risk and display alternatives for making strategic investments in fuel treatments at both the project and landscape scale.



Fuel Treatment

A Renewed Line of Work

“Fuel is the only element of fire behavior that is manageable, since weather and topography are beyond human control. Optimally arranged treatment units require half as many as randomly placed units to reduce fire growth. To achieve desired effects in tempering fire’s behavior, land managers must apply optimally placed treatments at a rate of 1% to 2% per year.” (Dr. Mark Finney, Rocky Mountain Research Station)

The JFSP Governing Board selected Fuel Treatment as a line of work in the fall of 2008, but this is a topic that we have supported since the inception of the Program in 1998. We have funded over 48 proposals such as ARCFuels by Dr. Alan A. Ager of the Pacific Northwest Research Station and the Strategic Placement of Treatments research of Dr. Finney at the Rocky Mountain Research Station. In addition, Dr. James McIver of Oregon State University led the nationwide Fire and Fire Surrogates research that examined whether thinning was a substitute for prescribed fire. The lessons learned in the Fire and Fire Surrogates research have been extended into a Great Basin-wide investigation called SageStep to provide managers with information on cheatgrass invasions and encroachment of woodland species such as pinyon pine and juniper.

Our current refocus in this line of work is to investigate the longevity of fire and non-fire fuels treatments, and to compare the effectiveness and economics of treatment regimes. Another area of interest is to develop a better understanding of how climate change may influence treatment effectiveness.

Project ID	Project Title
08-1-6-01	Validation of Fuel Consumption Models for Smoke Management Planning in the Eastern Regions of the United States
08-1-6-04	Evaluation of Smoke Models and Sensitivity Analysis for Determining their Emission Related Uncertainties
08-1-6-06	Evaluation and Improvement of Smoke Plume Rise Modeling
08-1-6-09	Airborne and Lidar Experiments for the Validation of Smoke Transport Models
08-1-6-10	Creation of a Smoke and Emissions Model Intercomparison Project (SEMIP) and Evaluation of Current Models

Smoke Management

Roundtables and Scientific Review Lead to Action

There is growing concern about public health issues from fire emissions and smoke impacts. At the same time, there is increasing air quality regulation.

In June 2007, the JFSP convened two roundtables – one in Arlington, Virginia and another in Seattle, Washington – on smoke management and air quality issues. The roundtables brought together incident commanders, wildland fire use managers, prescribed burn practitioners, air quality regulators and specialists, and non-governmental organizations interested in smoke management and air quality. Participants worked to articulate problems, develop possible solutions, and prioritize the most useful research needs.

Subsequently, a scientific review team cross-walked the needs identified in the roundtables with those contained in NOAA’s “Summary of Fire Weather User Needs and Issues Survey.” The overarching need was “a comprehensive synthesis of existing models and sub-models for all stages of the life cycle of smoke.”

The review team offered that a lack of quantitative information on the limitations of smoke and emissions models impedes the use of these tools for real-world applications. Model users have little or no information on model uncertainties, biases, or application limits and so cannot interpret and communicate the uncertainties in model outputs. Consequently, decision-makers and regulators are unsure of how to weigh analytical outputs and may place either too little or too much confidence in analytical results.

Our answer to this considerable uncertainty is an investment in project 08-1-6-10, Smoke and Emissions Model Intercomparison project, lead by Dr. Sim Larkin of the Pacific Northwest Research Station. He states, “This type of comparison project has been performed in other fields with considerable success” (e.g. Intergovernment Panel on Climate Change).

As a result of manager’s input and scientific review the JFSP invested over \$1.5 million in the following 5 projects in FY2008 shown in the adjacent table.

Our FY2009 research solicitation sought proposals on two additional smoke management topics:

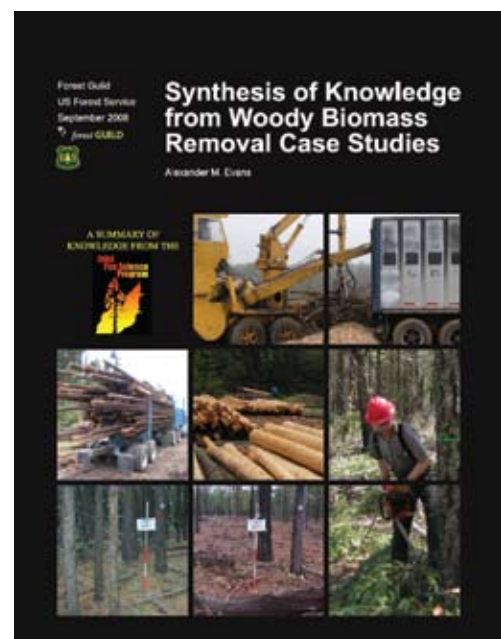
- ◆ Regional haze - ozone and secondary organic aerosol formation
- ◆ Smoke dispersion from low-intensity fires

Delivering New Information—Biomass Roundtables

In January of 2007, the first management roundtable held by the Program addressed managers' needs on the issue of biomass removal related to fuel treatment activities. Managers' from throughout the nation asked for evaluation and documentation of case studies, better estimators to plan for the biomass of hand piles, improved information on the economic and financial aspects of biomass removal, and better equations to estimate biomass, especially from noncommercial species. In response to these needs, the Governing Board selected five projects shown below.

Project ID	Project Title
07-2-1-57	Estimating the biomass of hand-piled fuels for smoke management planning
07-3-2-02	Inventory and evaluation of case studies to produce a guide to effective biomass removal strategies
07-3-2-08	Characterizing lessons learned from federal biomass removal projects
07-3-3-03	Enhancing Western Managers' Knowledge and Use of Available Economic and Financial Biomass Information and Tools
07-3-1-05	Literature Synthesis and Meta-analysis of Trees and Shrub Biomass Equations in North America

We are pleased to offer managers our first publication in a new series titled "Summary of Knowledge from the Joint Fire Science Program". All future JFSP synthesis publications will have the same consistent cover design and we are pleased to offer publications that managers can use as references for daily operations. You can find the report and much more on the Forest Guild website [http://biomass.](http://biomass.forestguild.org/)



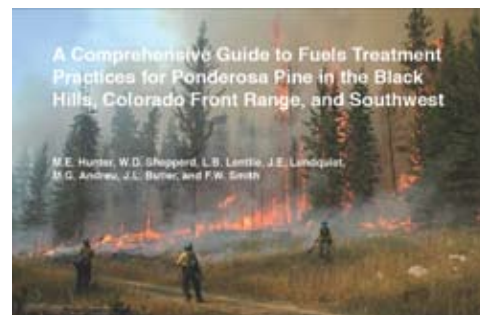
[forestguild.org/](http://biomass.forestguild.org/)

In the spring of FY 2009, we hope to have all of the above biomass projects completed, and will convene a workshop to present findings and ask our biomass managers about continuing biomass research needs.

Synthesis and Roadshows

Dr. Molly Hunter from Northern Arizona University and Dr. Wayne Shepperd, emeritus scientist from the Rocky Mountain Research Station and their colleagues recently produced A Comprehensive Guide to Fuels Treatment Practices for Ponderosa Pine in the Black Hills, Colorado Front Range, and Southwest (RMRS GTR 198) which can be found at: http://www.fs.fed.us/rm/pubs/rmrs_gtr198.html

As an extension of this publication, the JFSP sponsored four gatherings of scientists and managers in the field to discuss issues chosen by the managers. Two-day



field tours were held in the Black Hills of South Dakota, the Front Range of Colorado, and the ponderosa pine forests of northern New Mexico and Arizona. We term these learning opportunities "roadshows."

Managers at our South Dakota and Colorado roadshows clearly voiced a need for information on how to effectively manage an increasing bark beetle outbreak. The program solicited proposals for funding in FY2009 that address this emerging need:

- ❖ How do fuel properties (e.g., moisture content, volatile organic chemicals content, ignitability, etc.) change over time and space in response to fire, insect outbreaks and windstorms?
- ❖ How do fuel profiles (ground, surface, ladder and crown fuels) change over time and space in response to fire, insect outbreaks and windstorms?
- ❖ What are the effects of fire, insect outbreaks and windstorms on future fire behavior and how does that change over time and space?



- ❖ How does climate change and variability, especially prolonged drought, condition the effects of fire, insect outbreaks and windstorms on fuels and fire behavior?
- ❖ What are effective management strategies for addressing fuel hazards arising from insect outbreaks? Are potential increases in fuel hazard resulting from insect outbreaks of a sufficient magnitude to justify pre-outbreak treatments?

Participants on our Arizona and New Mexico roadshows expressed a continuing need for information related to the compatibility of fuel treatments and fire management with conservation of threatened, sensitive, and endangered wildlife species (TS&E). While many perceive that TS&E wildlife species conservation frequently conflicts with fire and fuels management, recent work has shown that the goals of maintaining critical habitat and restoring fire-adapted ecosystems can be compatible. The Governing Board solicited proposals in direct response to managers' needs:

- ❖ What fire or fuel management activities can be successfully implemented while maintaining key habitat features?
- ❖ Where on the landscape can fuel management activities be planned to maintain and improve key habitat features?
- ❖ How can habitats be sustained across broad landscapes that experience fire, particularly in areas that have experienced increased fuel loads from past fire suppression?
- ❖ How does fire spread and severity from fire and fuels management activities vary in their impacts to desired habitat features?
- ❖ How might these relationships vary with potential climate change?



Listening to Agency Experts

Another method that we use is to directly ask federal and state agencies about their needs at scheduled meetings. The national Bureau of Indian Affairs (BIA) fire management meeting in Albuquerque, New Mexico is one example of JFSP delivering on Agency requests. Fire prevention activities have been funded for the last 10 years based in large part on the presumed effectiveness of prevention techniques published in "Wildfire Prevention Strategies" (NWCG Publication PMS 455/NFES 1572, 1998). These effectiveness ratings have been carried forward into the Fire Program Analysis (FPA) Prevention Module, which is intended to guide future prevention funding allocations. The JFSP is seeking new answers in FY2009 related to BIA's need:

- ❖ What is the relationship among dollars spent for a specific prevention technique(s) and the reduction in number of fire starts?

In addition, a recent Department of the Interior management survey identified eight high priority research needs:

1. Update fire behavior prediction models to include all vegetation strata as well as smoldering spotting and crown spread and allow for seasonal variation i.e. fire behavior in discontinuous fuels-grassland, shrubland, and woodlands.
2. Fuels treatment management effectiveness and effectiveness duration which examine trade-offs between investment in fuels management and suppression.
3. Managed vs. uncontrolled wildland fire air quality effects and carbon sequestration tradeoffs (climate change).
4. Integration of numerous fire behavior and decision support tools/models.
5. Identify improved methods to accurately predict dry lightning and issue red flag warnings.
6. Develop vegetation/site scientific standards for post-wildfire recovery techniques addressing cost effective treatments. Techniques should address the probability of implementation success and effectiveness assessments providing guidance on short and long term area needs.

7. Develop improved methods for mapping burn severity especially focused on non-forested vegetation, i.e. shrublands, grasslands, and woodlands (arid lands and eastern woodlands), improving the accuracy, timing, and methodologies (e.g. dNBR, initial, extended, and BARC assessments).
8. Refinement of hydrologic watershed risk models to address both short and long term effects.

We are pleased to report that the JFSP has been actively involved in all of these priority issues and will continue to make future investments in support of identified management needs.

2009 Syntheses of Existing Knowledge

The JFSP invests in projects to summarize information in a form useful for managers. We meet regularly with National Wildfire Coordination Group committees to assess their needs for both research and synthesis topics. The Fire Behavior Committee asked us to provide a state-of-the-science report examining extreme fire behavior, and an assessment of the appropriate uses and limits of this information. This topic is included in our FY2009 synthesis solicitation along with:

1. An examination of our knowledge of historical fire regimes, an assessment of how this information can help us understand potential fire regimes in the face of climate change, and an interpretation of how this information can help shape fire and fuel management decisions.
2. Based on the success of our first guidebook by Hunter and Shepperd, we are seeking new guidebook proposals for the following major species: jack pine, white and red pine, Rocky Mountain lodgepole pine, ponderosa pine/Jeffrey pine and ponderosa pine/mixed conifer, chaparral and mountain shrub, and longleaf pine. The JFSP was charged in the 10-year strategy with developing these species specific guides throughout the nation.

JFSP 5-Year Program Review

As previously stated, the Joint Fire Science Program was initiated by Congress in 1998 as an interagency research, development, and applications partnership between the Departments of Agriculture and the Interior. Every five years an interagency and interdisciplinary review team assesses the status, effectiveness, relevance, and future direction of the program. The current review was completed in December 2008. The team was also charged with reviewing progress made on recommendations from the 2003 review. In all, the team made 31 recommendations in 7 areas.

The review team found “the program has made good progress in addressing recommendations presented in the prior [five year] review, and made strides in improving all aspects of the program’s mission including governance, the breadth and quality of research questions asked, outreach, science delivery, and technology transfer.”

The team also found “that a primary strength of the program is its ability, demonstrated over the years, to capture a wide range of relevant science and maintain a useful focus on applied questions.”

We encourage you to read the full report on the JFSP website at: http://www.firescience.gov/documents/Program_Review/JFSP_Program_Review_Final_Report_1-10-09.pdf

By the Numbers

Let’s turn our attention from where we are headed to what we have done over the last decade.

In the table below we track the JFSP appropriation, projects funded, number of projects that have been completed, and number of projects that are still in progress from the fiscal year of original funding. In all, 451 projects have been funded, 319 completed, with 132 projects in progress.

In 2001 the appropriation doubled to \$16 million a year from \$8 million. This allowed the number of projects to increase or fund more expensive research in 2001-2005. Since 2005, appropriations have settled into the range of \$12-14 million and 2009 funding will be \$14 million. Program office administrative expenditures average 4%. Science delivery activities average an additional 7%. Each year, 89% of JFSP’s appropriated funding goes directly to new research and synthesis projects.

Project Summary by Fiscal Year	Total	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998
Appropriation (in millions)	\$144	\$14	\$12	\$14	\$16	\$16	\$16	\$16	\$16	\$8	\$8	\$8
Projects Funded	451	33	37	49	61	44	58	54	65	7	23	20
Completed Projects	320	4	7	10	34	38	58	54	65	7	23	20
In Progress Projects	131	29	30	39	27	6	0	0	0	0	0	0

Categories of Investments

It is always difficult to categorize projects and often the nature of JFSP work is interdisciplinary. This means a fire effects project may have other elements embedded into the project such as social science and economics, fire behavior, or other disciplines. The table below describes where JFSP has invested its funding from 1998 through 2008.

Investment Category	Total Projects	Completed Projects	Active Projects	Percentage
Fire Effects-Fire Ecology	90	68	22	20%
Fuel Treatments	48	30	18	11%
Air Quality-Smoke Management—Climate-Weather	33	20	13	7%
Planning-Risk Assessment	30	24	6	7%
Postfire Stabilization-Rehabilitation	30	13	17	7%
Fire Regimes-Histories	28	17	11	6%
Science & Technology Applications	25	22	3	5%
Decision Support	22	15	7	5%
Invasive Species	21	12	9	5%
Inventory & Mapping	19	16	3	4%
Remote Sensing	18	17	1	4%
Social & Economic Science	18	12	6	4%
Fire Behavior	13	10	3	3%
Wildlife	12	7	5	3%
Workshops-Training-Demonstration Sites	37	35	2	8%
Other Projects	7	2	5	1%
Totals	451	320	131	100%

2008 Accomplishments

The program tracks 14 items in three areas: publications, presentations, and electronic data/websites. We call these “deliverables.” JFSP-sponsored scientists accomplished the following in FY 2008:

Type of Deliverable	Number
Publications	
Refereed Publications	74
Nonrefereed Publications	15
Ph.D. Dissertation	2
MS Thesis	8
Book or Book Chapter	1
JFSP Final Report	54
Presentations	
Invited Paper/Presentation	116
Poster Sessions	16
Training Sessions	20
Field Demonstration/Tours	8
Conference Workshops	41
Electronic Data/Websites	
Websites	10
Computer Model/Algorithm	4
Dataset (including spatial)	5

The table below shows the average cost of submitted proposals for the last 5 years. In 2008, these research proposal solicitations were very specific and focused on 6 areas of research resulting in fewer submitted proposals. In 2009, these program solicited proposals in 10 areas of research, 3 areas of synthesis, and a new science initiative in fire ecology. In spite of this wider solicitation, the average cost of proposals trended lower because the new science initiative capped proposals at \$150,000 and the synthesis proposals generally cost less because they deliver results in half the time of a research investigation. Nonetheless, requested funding significantly exceeds available funding.

Funding Trends				
Year	Proposals Submitted	Requested Funding	Average Cost of Proposals	Percentage of Proposals Funded
2009	179	\$40,800,441	\$228,304	20%
2008	98	\$24,752,310	\$252,575	34%
2007	163	\$46,233,013	\$330,236	23%
2006	203	\$62,620,607	\$308,476	24%
2005	216	\$74,674,599	\$345,716	28%

The Next 10 Years

This year we look back on ten years of progress in understanding fire and its effects, ten years of putting science in the hands of professionals entrusted to manage our natural places and their resources. This report shows our accomplishments and speaks to the outcomes of our efforts. But what about the next ten years?

As in any science endeavor, answering questions and building the fundamental understanding of why things are the way they are raise more questions and open more doors to refine our ability to manage fire on the landscape. New challenges are on the horizon and JFSP is poised to help meet those challenges. What drives fire spread where houses meet the forest? How can we use fire, but manage smoke to protect human health? How best should citizens respond to fire? How do we restore fire to the landscape, but protect the habitat of endangered species? What are the best tools available to managers to predict and assess fire behavior and effects? How should we manage lands after fire? How will a changing climate affect all we understand about fire? These

are but a few of the challenges that we face in the next ten years.

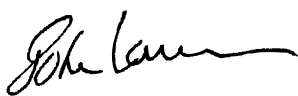
JFSP will continue on its mission, but with a more mature approach that funds lines-of-work, developed through interactions with land and fire managers, to provide the best science and tools to those managers so they can do their jobs. JFSP will concentrate funding on the most pressing issues while still addressing more site-specific needs as they arise. JFSP will continue to serve the broad audience of federal, state, and private partners with innovative science delivery.

We are proud of JFSP accomplishments and outcomes. We rely on the dedicated staff who run the program and recognize that, without them, JFSP could not succeed. We celebrate talented scientists and specialists funded by JFSP who make it all happen. We are confident that, 10 years from now, a different, but equally enthusiastic governing board will be reporting even more progress.

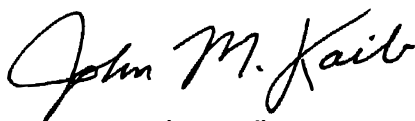
Joint Fire Science Program Governing Board



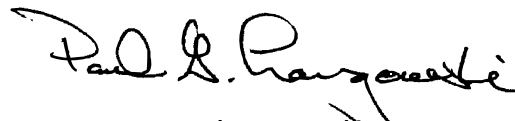
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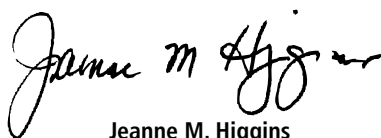
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At the Joint Fire Science Program we provide funding for:

- Developing new knowledge
- Building applications that are useful to fire and fuel managers
- Validating existing research through field trials
- Integrating management needs and research discoveries

AN INTERAGENCY RESEARCH, DEVELOPMENT, AND APPLICATIONS PARTNERSHIP



Learn more about the Joint Fire Science Program at

www.firescience.gov

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BLM/FA/GI-07/002+9217 (we need a new number)

Cover Photo: The cover photo is of the Hoover Fire in the Sierra Nevada Mountain Range – a wildland fire use (WFU) fire. Increasingly, WFU is a management option that plays an important role in returning the natural role of fire to the land. The JFSP is proud of our investments in research that supports wildland fire use that provide managers with information they can depend on to make sound decisions.

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